CLAIMS

1. A method of transmitting information units or packets from a plurality of queues into a single transmission medium, wherein the units or packets may have different sizes, the method comprising:

- a bandwidth guaranteeing process transferring units or packets from one or more queues of a first group of the queues to the transmission medium in a manner so that each of those queues can obtain at least a predetermined bandwidth, and
- a queuing process comprising the steps of:
  1. assigning a priority or quality to each of the queues in a second group of queues,
  2. defining, for each of the queues in the second group, a variable, and
  3. when no queues transmit units or packets using the bandwidth guaranteeing process:
     - determining a queue in the second group having a variable with a value fulfilling a predetermined criterion,
     - transmitting a packet or unit from that queue to the transmission medium, and
     - determining a new value for the variable of the queue, the new value relating to a mathematical operation using a previous value for the variable at a point in time prior to transmission of the packet or unit and a factor scaling with/relating to the priority or quality of the queue multiplied with a factor relating to a size of the packet or unit transmitted from the queue and/or a period of time used for transmitting the packet or unit, where the mathematical operation brings the new value to, compared to the previous value, not fulfil the predetermined criterion.

2. A method according to claim 1, wherein step 3 comprises: when no queues transmit units or packets using the bandwidth guaranteeing process:

- determining a queue in the second group (having data) having a variable with a smallest value,
- transmitting a packet or unit from that queue to the transmission medium, and

- determining a new value for the variable of the queue, the new value relating to a value for the variable at a point in time prior to transmission of the packet or unit plus a factor scaling with/relating to the priority or quality of the queue multiplied with a factor relating to a size of the packet or unit transmitted from the queue and/or a period of time used for transmitting the packet or unit.

3. A method according to claim 1, wherein the step of transmitting the data packet or unit comprises transmitting the packet or unit in accordance with a periodic timing signal and wherein the step of determining the new value for the queue comprises, during transmission and for each period of the timing signal, providing a new value for the variable by performing the predetermined mathematical operation on a previous variable value and a factor scaling with the priority or quality of the queue.

4. A method according to claim 1, wherein step 3 is adapted to be stopped, with a first set of values, when a packet or unit has been transmitted and a queue from the first group of queues wishes to transmit a packet or unit and to be resumed with a second set of values each corresponding to a value of the first set of values, when none of the queues of the of the first group wishes to transmit a packet or unit.

5. A method according to claim 1, wherein step 3 comprises the step of altering the variables of the queues of the second group in accordance with a predetermined relationship.

6. A method according to claim 1, further comprising the step of determining a bandwidth used for at least one of the queues.

7. A method according to claim 6, further comprising the step of altering, on the basis of the bandwidth used by a queue, a parameter of the bandwidth guaranteeing process for the queue and/or the priority/scaling of the step of determining a new value for the queue.

8. A method according to claim 6, further comprising the step of providing information to an operator of the bandwidth used.

9. A method according to claim 1, wherein the step of defining the variable comprises defining an integer value relating to a priority or quality of each queue.

10. An apparatus for transmitting information units or packets from a plurality of queues into a single transmission medium, wherein the units or packets may have different sizes, the apparatus comprising:

- bandwidth guaranteeing means for transferring units or packets from one or more queues of a first group of the queues to the transmission medium in a manner so that each of those queues can obtain at least a predetermined bandwidth, and
- queuing means comprising:
  1. means for assigning a priority or quality to each of the queues in a second group of queues,
  2. means for defining, for each of the queues in the second group, a variable, and
  3. means for, when no queues transmit units or packets using the bandwidth guaranteeing process:
     - determining a queue in the second group (having data) having a variable with a value fulfilling a predetermined criterion,
     - transmitting a packet or unit from that queue to the transmission medium, and
     - determining a new value for the variable of the queue, the new value relating to a mathematical operation using a previous value for the variable at a point in time prior to transmission of the packet or unit and a factor scaling with/relating to the priority or quality of the queue multiplied with a factor relating to a size of the packet or unit transmitted from the queue and/or a period of time used for transmitting the packet or unit, where the mathematical operation brings the new value to, compared to the previous value, not fulfil the predetermined criterion.

11. An apparatus according to claim 10, wherein the means 3 comprise means for: when no queues transmit units or packets using the bandwidth guaranteeing process:

- determining a queue in the second group having a variable with a smallest value,

- transmitting a packet or unit from that queue to the transmission medium, and
- determining a new value for the variable of the queue, the new value relating to a value for the variable at a point in time prior to transmission of the packet or unit plus a factor scaling with/relating to the priority or quality of the queue multiplied with a factor relating to a size of the packet or unit transmitted from the queue and/or a period of time used for transmitting the packet or unit.

12. An apparatus according to claim 10, wherein the means for transmitting the data packet or unit comprises means for transmitting the packet or unit in accordance with a periodic timing signal and wherein the means for determining the new value for the queue comprise means for, during transmission and for each period of the timing signal, providing a new value for the variable by performing the predetermined mathematical operation on a previous variable value and a factor scaling with the priority or quality of the queue.

13. An apparatus according to claim 10, wherein the means 3 are adapted to be stopped, with a first set of values, when a packet or unit has been transmitted and a queue from the first group of queues wishes to transmit a packet or unit and to be resumed with a second set of variables each corresponding to a value of the first set, when none of the queues of the of the first group wishes to transmit a packet or unit.

14. An apparatus according to claim 10, wherein the means 3 are adapted to alter the variables of the queues of the second group in accordance with a predetermined relationship.

15. An apparatus according to claim 10, further comprising means for determining a bandwidth used for at least one of the queues.

16. An apparatus according to claim 15, further comprising means for altering, on the basis of the bandwidth used by a queue, a parameter of the bandwidth guaranteeing means for the queue and/or the priority/scaling of the means for determining a new value for the queue.

17. An apparatus according to claim 15, further comprising means for providing information to an operator of the bandwidth used.

18. An apparatus according to claim 10, wherein the means for defining the variable comprises means for defining an integer value relating to a priority or quality of each queue.

19. An apparatus according to claim 10 and being embodied on a single ASIC, further comprising:

- a number of input ports either connected directly to one or more data packet/unit providers, and
- at least one output to the medium.